MECKLENBURG COUNTY CodeEnforcement
Land Use and Environmental Services Agency

Electrical Consistency Meeting **November 14, 2018**

Committed To: **QUALITY INSPECTIONS AND EXCELLENT CUSTOMER SERVICE**

Our Goal is: **FOR ALL STAKEHOLDERS TO HAVE A SUCCESSFUL PROJECT with us and that together we keep people and structures safe and buildings economically viable to serve the needs of our community.**

I. **Customer Service Highlight:**
II. **Electrical Consistency Questions**

1. I was told by an inspector that I had to GFCI protect my dishwasher and disposal. I thought NC had an amendment that deleted this code section, am I wrong? –

   No, you are not wrong, the NC Amendments for the 2017 NEC did delete section 210.8(D).

AMENDMENT 210.52(B)(2)
Amend NEC 2017, page 65:

(2) No Other Outlets. The two or more small-appliance branch circuits specified in 210.52(B)(1) shall have no other outlets.

Exception No. 1: A receptacle installed solely for the electrical supply to and support of an electric clock in any of the rooms specified in 210.52(B)(1).

Exception No. 2: Receptacles installed to provide power for supplemental equipment and lighting on gas-fired ranges, ovens, or counter mounted cooking units.

Exception No. 3: Receptacles installed inside a dwelling and within 1.8 m (6 ft) of any kitchen sink measured by the shortest path that the cord of an appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, or fixed barrier.

AMENDMENT 210.8(D)
Amend NEC 2017, page 59:

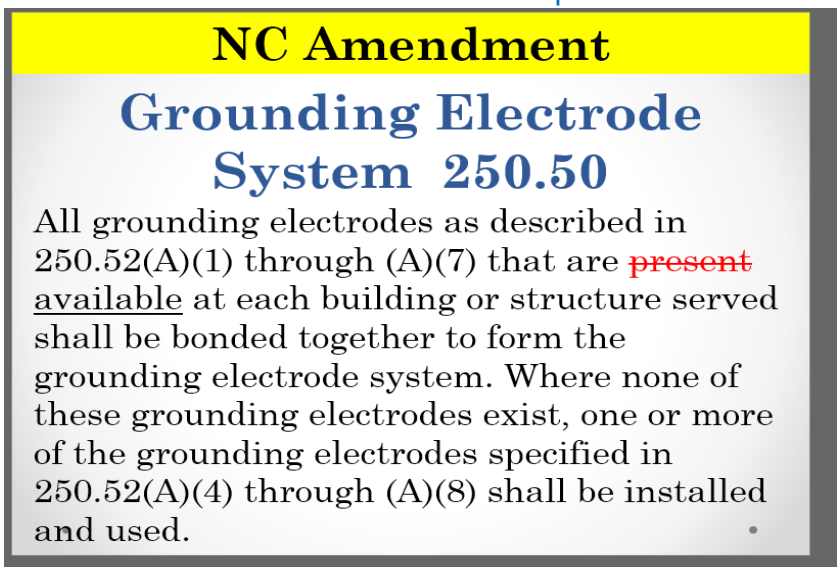
(D) Kitchen Dishwasher Branch Circuit.
Deleted.

2. How far from a pool is an electric pool heater required to be?
   A. Without additional information this equipment would fall under “Other Outlets” in 680.22(D) and would require to be 10 feet away from edge of pool.

3. Due to the re-wording of Article 250.50, by the NC Amendments, please provide clarification for Ufer grounding systems.

A. The Ufer ground is required if
(a) it meets the NEC requirements for the concrete encased electrodes, in NEC article 250.52(A)(3),
(b) it is available prior to concrete installation.

Catch 22, We are tasked to instruct the installer and builders that the CEE is required (if installed) However we cannot fail a project if they chose not to either install it or inspect it. If it is installed to be considered a viable part of the GES it must be inspected.



4. I was recently failed in a plan review, that included a load side metering system that was fed with a 2000 ampere main breaker to a retail trough. The service CT’s and OCD/Disconnecting means mounted above the trough, fed 400-amp retail panels using two parallel 3” conduits with 4-250 and 1 #1 aluminum conductors in each conduit. The notes indicated that each grounding conductor is required to be 400 kcmil al, per 250.122, based on the 2000 Main OCD. That I understand however, in 250.122(A) it is stated that the grounding conductors are never required to be larger than the ungrounded conductors. Please explain?
   A. Load side metering requires that the power conductors ran to the separate tenant disconnecting means is in reality a tap from a feeder circuit. The EGC provided for the circuit if it is a wire must be sized to clear the over-current device ahead of the feeder, (250.122(G)) in this case a 2000 ampere, or a 400kcmil al. The feeder conductors are installed in parallel of 2-250kcmil al, in two conduits. 250.122(F)(1)(b) states that each EGC is to be installed in each parallel conduit based on the size of the over-current ahead of the feeder.

5. I have an addition of a detached accessory dwelling at a residential property. The existing dwelling is supplied through an exterior CT can feeding 2-200 Main breaker panels on the inside of an exterior wall. The client wants to feed the new accessory dwelling, directly from the CT can using UG conduit to a new service main on the accessory building. Is this acceptable?
   A. Yes, per 230.40 Ex. #3

> *Exception No. 3: A one-family dwelling unit and its accessory structures shall be permitted to have one set of service-entrance conductors run to each from a single service drop, set of overhead service conductors, set of underground service conductors, or service lateral.*
>
> A second set of service-entrance conductors supplied by a single service drop or lateral at a single-family dwelling unit is permitted to supply another building on the premises, such as a garage or storage shed. The utility meters may be grouped at one location, but in this application, the service disconnecting means are not required to be grouped at one location.

6. Is a wet bar required to have the 2/4 receptacle spacing? Is it required to be on a 20A circuit?
   A. A wet bar is not required to meet counter top receptacle spacing or kitchen circuit requirements, the counter space is required to be included in the wall space receptacle placement. If the bar is located in a room, adjacent to the kitchen or dining room, it is considered a "Butler's Pantry" and then is considered an extension of the kitchen counter space and require kitchen counter top spacing and circuitry. If the bar is in a separate portion of a residence, with permanent provisions for cooking it is considered a kitchen and requires kitchen spacing and circuitry.

7. Can I have a receptacle face up under a free-standing range, in the floor, flush mounted, with a plastic cut-in box? I don't see a problem with this.
   A. Receptacles mounted in the floor must use approved and listed boxes for the purpose, and fit the application, per 314.27(B)

8. I had a furnace change out under a house, like for like. The furnace circuit was not dedicated originally. It is a grounded circuit. The house was built in the late 60's. Is a new dedicated circuit required?
   A. On a like for like changeout the existing circuit can be reconnected if it was legal at the time of installation. If the manufacturer's specifications require a dedicated circuit, then a dedicated circuit is required with the replacement, additionally the furnace cannot exceed 50% of the rating of the circuit.

9. Are pool and spa heaters required to be GFCI protected?
   A. Listed Electric pool heaters are not required to be installed on GFCI circuits unless location and connections trigger GFCI, they are required to be installed per 680.10. Gas pool heaters are required to be GFCI protected per 680.28

10. Why do I need a load calculation for the house to install a generator? Where do I get this?
    A. 702.4(B) requires that the system be calculated to verify load imposed on the generator. (1) allows manual selection of loads to be connected. (2) requires generators be sized to supply all loads under automatic transfer or be provided with automatic load shedding.

    In all installations the load must be verified

11. Is it permissible to connect two noncurrent carrying metal parts of electrical equipment with a Sheetmetal screw? Is the screw required to be green? 250.4 A (1)

    A. 250.8 is where the "machine thread" requirement is found, however this covers the attachment of grounding conductors and bonding jumpers. Metal to metal connections can be installed with sheet metal threading screws. The Green color for grounding screws is limited to screws used as Main Bonding Jumper.

12. I have a three-bay garage How many CIRCUITS do I need? Is it permissible to connect lights in my detached garage to the dedicated circuit required by 210.11(C)(4)?

    A. One dedicated 20-amp circuit, a receptacle in each bay. The dedicated circuit can feed exterior receptacles that are readily accessible, however it cannot feed lighting outlets

13. I have a 240V boat lift. Is it required to be GFCI protected?
    A. Yes 210.8(C)

14. I have a cryotherapy project that has vitamin IV drip stations. Would this procedure per the definition be mandated to use hospital grade MC cable?"

    "Cryotherapy- (definition) the use of extreme cold in surgery or other medical treatment
    A. It is dependent on the building occupancy, if this is a "B" Business occupancy the NEC 517 is not enforceable. If it is a "I" Institutional occupancy, it may be classified as a healthcare facility triggering the 517 requirements.

15. I have a project at a gasoline dispensing station, I ran a sign circuit to the marquee sign at the street. The conduit is underground however, it is less than 20 feet from the dispensers, and ran in a

separate trench than the large one that was excavated to install the disperser wiring. Now the inspector is requiring the sign conduit to be RGS and be sealed on both ends. Is this a code requirement?

A. Yes, 514.8 requires the conduit passing under this Class 1 Div. 2 zone to be sealed and RGS, the Exception 2 allows PVC to ran at least 2 feet below grade.

16. On my current project, the engineer designed a 75 KVA transformer to feed 2 separate 200-amp panels, with 150-amp main circuit breakers. The load sheets indicate on has 116 amps and the other has 101 amps calculated connected load. The 75 KVA has a secondary ampere rating of 208 amps. Is this code compliant?

    A. Yes, per. 450.3(B) notes 1 and 2, Discuss

17. Per NEC article 376 Metal wireways are not required to be listed, and in the past, we had these fabricated by a local sheet metal company. Now I am failing multiple installations because these gutters are not “listed”. Where is the NEC code backup?
    A. Manufactured metal wireways and gutters are required to be listed if used for grounding. The equipment must be of substantial construction and installed and supported properly for application. NEC 376 and 250.118(13)

18. I am wiring some apartments, where I pulled #12 Romex from the unit panel to the A/C condensing unit outside. When the A/Cs were set, I noticed that the minimum circuit amps were 20.2. Using the 60-degree chart, I can only load #12 Romex to 20 amps. Is this wire ok, or am I screwed?

    A. 430.25 requires the conductor to be sized to not be less than the Minimum circuit ampacity marked on the nameplate, #12 NM has a maximum ampacity of 20-amperes. If it is field calculated it shall be permitted to be rounded to the nearest ampere, with the decimal fractions smaller than 0.5 dropped. 220.5(B).

19. Does a single motor circuit with power conversion equipment located in an industrial facility with 24/7 maintenance require GFCI protection? NEC 430.130

No, 430.130 requires Branch-circuit, short-circuit and ground fault protection, GFCI is a different type of over-current protection (Discuss)

20. I have a 40"x40" CT can mounted outside for a main service of 1200A. I have parallel 500MCM copper conductors x3 for my service entrance conductors. I intend to bond my CT can with one of my parallel grounded conductors but my inspector said I have to bond all three to the CT can? This is new... what gives?

    The following answer, was taken from the April 2018 Electrical Consistency Meeting:

    4. When bonding service enclosures where paralleled grounded service conductors are enclosed, is it required to attach the main bonding jumper to *all* the paralleled service grounded conductors?

       A. Yes, the requirements of 310.10(H), must be followed for the service ungrounded and grounded conductors, all the individual parallel conductors must have the same connection and physical effects imposed on all of the paralleled set conductors.

21. I am adding on a new 1600 amp service to an existing building that's located more than 50' from the original service that is insufficiently sized to feed our new loads. My new service will have a main/service disconnect outside while the original service has its main located inside. The inspector told me my new service disconnect needed to match the existing service disconnect location or I could move the existing one to match the new? This seems unfair, where is this in the code?

    A. NEC 230.2(B) details additional services "By Special Permission" if that is the section this additional service falls under, then the 50 feet distance and the "All in or All out" clause is required. If the additional service is allowed due to capacity or voltage uses (230.2 (C) and (D)) then the additional service is allowed to be at the designer's discretion. 250.58 common grounding electrode is required and proper labeling is required regardless

22. How is Meck County looking at cut in boxes being used in ceilings at this time? May not want to bring this question up outside of the task team.
    A. All old work boxes must be approved and listed for their applications

23. How many ground rods are required at a detached structure? I.E. detached garage. Can I use the equipment ground in lieu of a second rod? If so what is the min/max size of this conductor?

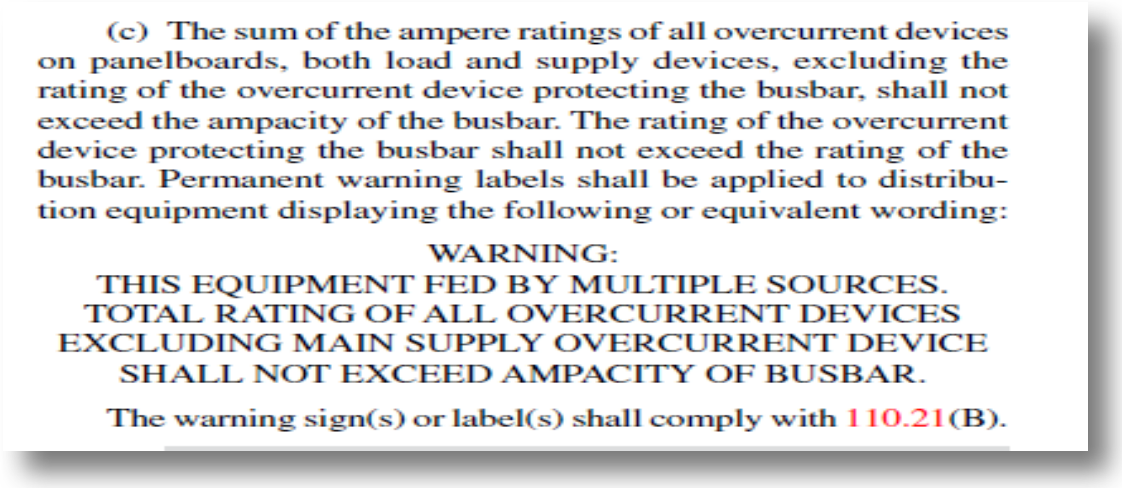
A. a. 2 ground rods are required. b. there are limited instances that an Equipment Grounding Conductor can be used as a Grounding Electrode Conductor (250.121) however, it does not fit this scenario.

Discussion needed

24. Questions from the last PV team meeting?

a. How do I calculate the load applied on the service conductors on a line side tap for PV?
(1) The service conductors themselves are protected by the main overcurrent device, the tap conductors would be sized based on the overcurrent devices ahead of them or 125% of the maximum source output amperes

b. How do I calculate the maximum PV load that can be put on a bussbar when using a breaker and the breaker is installed in the middle of the buss rather than at the opposite end of the main.
(2) 705.12(B)(2)(3)(c)



(c) The sum of the ampere ratings of all overcurrent devices on panelboards, both load and supply devices, excluding the rating of the overcurrent device protecting the busbar, shall not exceed the ampacity of the busbar. The rating of the overcurrent device protecting the busbar shall not exceed the rating of the busbar. Permanent warning labels shall be applied to distribution equipment displaying the following or equivalent wording:

WARNING:
THIS EQUIPMENT FED BY MULTIPLE SOURCES.
TOTAL RATING OF ALL OVERCURRENT DEVICES
EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE
SHALL NOT EXCEED AMPACITY OF BUSBAR.

The warning sign(s) or label(s) shall comply with 110.21(B).

Discussion:

a) MCCE is no longer removing the neutral conductors to verify AFCI devices on residential or apartment finals. The 2017 code now requires all terminations to be torqued to the manufacturer's specifications, we have no means to provide the correct torque inch pounds. It follows that we are to verify through the accurate and complete panel directory for the AFCI requirements. The structure will be plugged out for all receptacles accessible using the continuity tester/flashlight, and verification of lighting, equipment and switch grounding through continuity to ground. Equipment will be inspected as normal for connection, wiring method, grounding, and over-current protection.

b) MCCE is no longer requiring IBA or OTI inspections to witness Generator testing and commissioning. The generator will be inspected for installation, connection and grounding as any other equipment. If the inspector would like to witness the test of the completed system for FI, it can be conducted with the building and fire inspectors or can be tested in addition at time of electrical FI. Any other inspections required are at the electrical inspector's discretion.